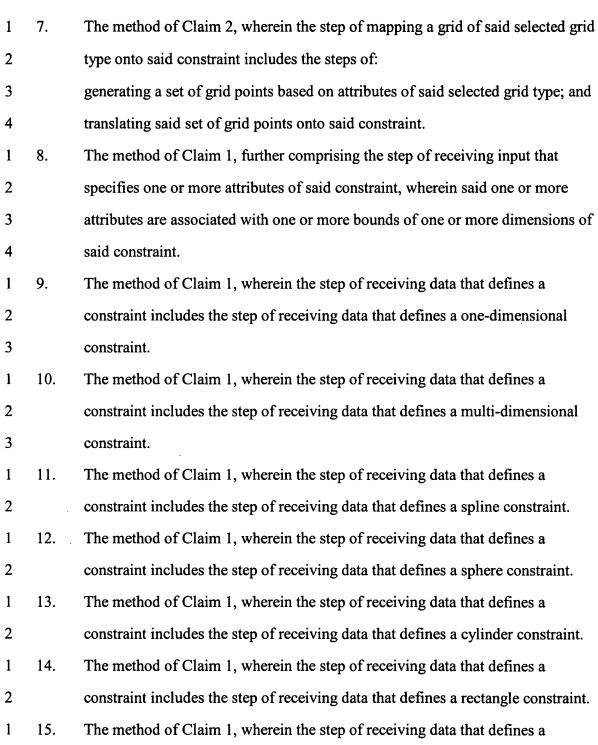CLAIMS
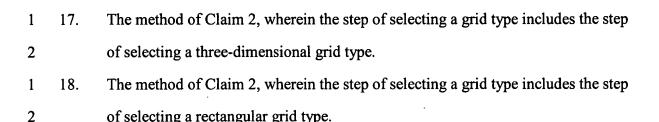
What is claimed is:

1. A method for determining the spacing of objects, the method comprising the steps of:

    receiving data that defines a constraint;

    receiving a set of spacing parameter values that indicate how to space objects across said constraint; and

    generating a set of points for spacing objects across said constraint based on a bound of at least one dimension of said constraint and said set of spacing parameter values.

2. The method of Claim 1, wherein the step of generating a set of points for spacing objects across said constraint further comprises the steps of:

    selecting a grid type from a plurality of grid types, wherein the grid type is associated with one or more grid attributes; and

    mapping a grid of said selected grid type onto said constraint.

3. The method of Claim 2, wherein the step of selecting a grid type includes the step of selecting the grid type based on the set of received spacing parameter values.

4. The method of Claim 2, wherein the step of selecting a grid type includes the step of selecting the grid type based on the defined constraint.

5. The method of Claim 2, wherein the step of selecting a grid type includes the step of selecting the grid type based on user input that specifies a particular type of grid that is to be used.

6. The method of Claim 2, wherein the step of selecting a grid type includes the step of selecting the grid type based on the set of spacing parameter values and the defined constraint.

49658-0512

1 7. The method of Claim 2, wherein the step of mapping a grid of said selected grid
2   type onto said constraint includes the steps of:
3   generating a set of grid points based on attributes of said selected grid type; and
4   translating said set of grid points onto said constraint.

1 8. The method of Claim 1, further comprising the step of receiving input that
2   specifies one or more attributes of said constraint, wherein said one or more
3   attributes are associated with one or more bounds of one or more dimensions of
4   said constraint.

1 9. The method of Claim 1, wherein the step of receiving data that defines a
2   constraint includes the step of receiving data that defines a one-dimensional
3   constraint.

1 10. The method of Claim 1, wherein the step of receiving data that defines a
2   constraint includes the step of receiving data that defines a multi-dimensional
3   constraint.

1 11. The method of Claim 1, wherein the step of receiving data that defines a
2   constraint includes the step of receiving data that defines a spline constraint.

1 12. The method of Claim 1, wherein the step of receiving data that defines a
2   constraint includes the step of receiving data that defines a sphere constraint.

1 13. The method of Claim 1, wherein the step of receiving data that defines a
2   constraint includes the step of receiving data that defines a cylinder constraint.

1 14. The method of Claim 1, wherein the step of receiving data that defines a
2   constraint includes the step of receiving data that defines a rectangle constraint.

1 15. The method of Claim 1, wherein the step of receiving data that defines a
2   constraint includes the step of receiving data that defines a line segment
3   constraint.

1 16. The method of Claim 2, wherein the step of selecting a grid type includes the step
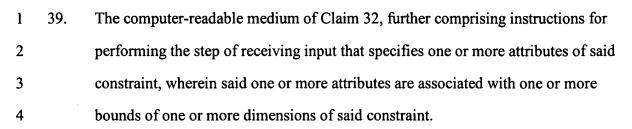2   of selecting a two-dimensional grid type.

49658-0512

1 17. The method of Claim 2, wherein the step of selecting a grid type includes the step

2 of selecting a three-dimensional grid type.

1 18. The method of Claim 2, wherein the step of selecting a grid type includes the step

2 of selecting a rectangular grid type.

1 19. The method of Claim 2, wherein the step of selecting a grid type includes the step

2 of selecting a polar grid type.

1 20. The method of Claim 2, wherein the step of selecting a grid type includes the step

2 of selecting a hex grid type.

1 21. The method of Claim 2, wherein the step of selecting a grid type includes the step

2 of selecting a triangular mesh grid type.

1 22. The method of Claim 2, wherein the step of selecting a grid type includes the step

2 of selecting a spherical grid type.

1 23. The method of Claim 2, wherein the step of selecting a grid type includes the step

2 of selecting a random grid type.

1 24. The method of Claim 2, wherein the step of selecting a grid type includes the step

2 of selecting a scattered grid type.

1 25. The method of Claim 1, further comprising the step of receiving a set of object

2 information, wherein the set of object information identifies a particular object to

3 be placed on the constraint at locations based on said generated set of points.

1 26. The method of Claim 25, wherein the step of generating the set of grid points

2 includes the steps of generating the set of grid points based on the set of object

3 information.

1 27. The method of Claim 26, wherein:

2 the set of object information identifies a bounding box that is associated with the

3 particular object; and

49658-0512

4   the step of generating the set of grid points based on the set of object information

5   comprises the step of generating the set of grid points based the bounding

6   box.

1   28. The method of Claim 2, wherein the step of mapping a grid of said selected grid

2   type onto said constraint includes the step of determining one or more locations to

3   place objects on said constraint by identifying one or more areas of said grid that

4   intersect said constraint.

1   29. The method of Claim 28, further comprising the step of:

2   receiving pivot point information, wherein the pivot point information specifies

3   pivot points for the placement of objects relative to the generated set of

4   points; and

5   placing objects on said constraint such that the pivot points of said objects

6   coincide with said one or more locations.

1   30. The method of Claim 28, further comprises the steps of:

2   identifying a particular object;

3   generating a copy of said particular object; and

4   placing the copy of said particular object at one or more of said one or more

5   locations.

1   31. The method of Claim 28, further comprises the steps of:

2   identifying a particular object;

3   generating an instance of said particular object; and

4   placing the instance of said particular object at one or more of said one or more

5   locations.

1   32. A computer-readable medium carrying one or more sequences of instructions for

2   determining the spacing of objects, wherein execution of the one or more

3   sequences of instructions by one or more processors causes the one or more

4   processors to perform the steps of:

49658-0512

5   receiving data that defines a constraint;

6   receiving a set of spacing parameter values that indicate how to space objects

7   across said constraint; and

8   generating a set of points for spacing objects across said constraint based on a

9   bound of at least one dimension of said constraint and said set of spacing

10   parameter values.

1   33.   The computer-readable medium of Claim 32, wherein the step of generating a set

2   of points for spacing objects across said constraint further comprises the steps of:

3   selecting a grid type from a plurality of grid types, wherein the grid type is

4   associated with one or more grid attributes; and

5   mapping a grid of said selected grid type onto said constraint.

6

1   34.   The computer-readable medium of Claim 33, wherein the step of selecting a grid

2   type includes the step of selecting the grid type based on the set of received

3   spacing parameter values.

1   35.   The computer-readable medium of Claim 33, wherein the step of selecting a grid

2   type includes the step of selecting the grid type based on the defined constraint.

1   36.   The computer-readable medium of Claim 33, wherein the step of selecting a grid

2   type includes the step of selecting the grid type based on user input that specifies a

3   particular type of grid that is to be used.

1   37.   The computer-readable medium of Claim 33, wherein the step of selecting a grid

2   type includes the step of selecting the grid type based on the set of spacing

3   parameter values and the defined constraint.

1   38.   The computer-readable medium of Claim 33, wherein the step of mapping a grid

2   of said selected grid type onto said constraint includes the steps of:

3   generating a set of grid points based on attributes of said selected grid type; and

4   translating said set of grid points onto said constraint.

1 39. The computer-readable medium of Claim 32, further comprising instructions for
2   performing the step of receiving input that specifies one or more attributes of said
3   constraint, wherein said one or more attributes are associated with one or more
4   bounds of one or more dimensions of said constraint.

1 40. The computer-readable medium of Claim 32, wherein the step of receiving data
2   that defines a constraint includes the step of receiving data that defines a one-
3   dimensional constraint.

1 41. The computer-readable medium of Claim 32, wherein the step of receiving data
2   that defines a constraint includes the step of receiving data that defines a multi-
3   dimensional constraint.

1 42. The computer-readable medium of Claim 33, wherein the step of selecting a grid
2   type includes the step of selecting a two-dimensional grid type.

1 43. The computer-readable medium of Claim 33, wherein the step of selecting a grid
2   type includes the step of selecting a three-dimensional grid type.

1 44. The computer-readable medium of Claim 33, wherein the step of selecting a grid
2   type includes the step of selecting a rectangular grid type.

1 45. The computer-readable medium of Claim 33, wherein the step of selecting a grid
2   type includes the step of selecting a polar grid type.

1 46. The computer-readable medium of Claim 33, wherein the step of selecting a grid
2   type includes the step of selecting a triangular mesh grid type.

1 47. The computer-readable medium of Claim 33, wherein the step of selecting a grid
2   type includes the step of selecting a spherical grid type.

1 48. The computer-readable medium of Claim 32, further comprising instructions for
2   performing the step of receiving a set of object information, wherein the set of
3   object information identifies a particular object to be placed on the constraint at
4   locations based on said generated set of points.

1   49.   The computer-readable medium of Claim 48, wherein the step of generating the

2   set of grid points includes the steps of generating the set of grid points based on

3   the set of object information.

1   50.   The computer-readable medium of Claim 49, wherein:

2   the set of object information identifies a bounding box that is associated with the

3   particular object; and

4   the step of generating the set of grid points based on the set of object information

5   comprises the step of generating the set of grid points based the bounding

6   box.

1   51.   The computer-readable medium of Claim 33, wherein the step of mapping a grid

2   of said selected grid type onto said constraint includes the step of determining one

3   or more locations to place objects on said constraint by identifying one or more

4   areas of said grid that intersect said constraint.

1   52.   The computer-readable medium of Claim 51, further comprising instructions for

2   performing the step of:

3   receiving pivot point information, wherein the pivot point information specifies

4   pivot points for the placement of objects relative to the generated set of

5   points; and

6   placing objects on said constraint such that the pivot points of said objects

7   coincide with said one or more locations.

1   53.   The computer-readable medium of Claim 51, further comprising instructions for

2   performing the steps of:

3   identifying a particular object;

4   generating a copy of said particular object; and

5   placing the copy of said particular object at one or more of said one or more

6   locations.

1 54. The computer-readable medium of Claim 51, further comprising instructions for

2 performing the steps of:

3 identifying a particular object;

4 generating an instance of said particular object; and

5 placing the instance of said particular object at one or more of said one or more

6 locations.

1 55. A computer system for determining the spacing of objects, the system comprising:

2 a memory;

3 one or more processors coupled to the memory; and

4 a set of computer instructions contained in the memory, the set of computer

5 instruction including computer instructions which when executed by the

6 one or more processors, cause the one or more processors to perform the

7 steps of:

8 receiving data that defines a constraint;

9 receiving a set of spacing parameter values that indicate how to space

10 objects across said constraint; and

11 generating a set of points for spacing objects across said constraint based

12 on a bound of at least one dimension of said constraint and said set

13 of spacing parameter values.

1 56. The computer system of Claim 55, wherein the step of generating a set of points

2 for spacing objects across said constraint further comprising instructions for

3 performing the steps of:

4 selecting a grid type from a plurality of grid types, wherein the grid type is

5 associated with one or more grid attributes; and

6 mapping a grid of said selected grid type onto said constraint.

7

1 57. A computer system for determining the spacing of objects, the system comprising:

49658-0512

2   means for receiving data that defines a constraint;

3   means for receiving a set of spacing parameter values that indicate how to space

4   objects across said constraint; and

5   means for generating a set of points for spacing objects across said constraint

6   based on a bound of at least one dimension of said constraint and said set

7   of spacing parameter values.

1   58.   The computer system of Claim 57, wherein the step of generating a set of points

2   for spacing objects across said constraint further comprising:

3   means for selecting a grid type from a plurality of grid types, wherein the grid type

4   is associated with one or more grid attributes; and

5   means for mapping a grid of said selected grid type onto said constraint.

49658-0512